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### AMENDMENTS TO THE CLAIMS:

A listing of the entire set of claims (including amendments to the claims) is submitted herewith. The listing of claims replaces all prior versions, and listing of claims in the Application.

1-17. (Canceled)

18. (Currently Amended) An article comprising machine-readable media having encoded thereon a model of a biological system, the model comprising:

one or more symbols representing ~~an initial hypothetical state of one or more biological elements of the biological system in an initial hypothetical state; and , wherein the initial hypothetical state is indicative of the initial presence of one or more biochemical characteristics of the one or more biological elements, and further comprising~~

one or more rules that express a substitution of at least one symbol by at least another symbol, at least some of the rules representing interactions between biological elements, and at least some of the rules being expressed in a manner that enables an inference engine to process the rules by substituting symbols to infer, from the one or more symbols representing the initial hypothetical state, alternative resultant states, ~~indicative of the presence of one or more biochemical characteristics of the one or more biological elements~~

wherein one or more of the symbols representing the biological elements is typed,  
wherein types of symbols are organized in hierarchical classes, and  
wherein a symbol for one of the hierarchical classes is matched by any symbol that is a member of the hierarchical class.

19. (Original) The article of claim 18 wherein one or more of the rules comprises an operator for expressing a relationship between at least two of the biological elements, the operator conforming to associative and commutative properties.

20. (Original) The article of claim 18 wherein one or more of the rules expresses concurrent state transitions.

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21. (Original) The article of claim 18 wherein at least some of the rules are not terminating.

22. (Original) The article of claim 18 wherein at least one of the rules represents a feedback or feedforward interaction between biological elements.

23-26. (Canceled)

27. (Original) The article of claim 18 wherein at least some of the rules are conditional.

28. (Canceled)

29. (Canceled)

30. (Original) The article of claim 18 wherein one or more of the symbols represents a drug or exogenous agent.

31. (Canceled)

32. (Previously Presented) An article comprising machine-readable media having encoded thereon a model of a biological system, the model comprising rules that express a substitution of at least one symbol by at least another symbol, the symbols representing a biological element, and at least one of the rules being expressed in a manner that enables an inference engine to infer alternative results from the system based on an initial hypothetical state wherein the model of the biological system includes a first set of symbols representing molecules in a first cell and a second set of symbols representing molecules in a second cell.

33. (Original) The article of claim 32 wherein one or more of the first set of symbols comprises the same symbols of the second set.

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34-95. (Canceled)

96. (Currently Amended) An article comprising machine-readable media having encoded thereon software configured to cause the processor to:

receive a set of symbols in an inference engine, the set of symbols representing an initial hypothetical state of ~~one or more biological elements~~ of a biological system, wherein the symbols represent biological elements ~~the initial hypothetical state is indicative of the initial presence of one or more biochemical characteristics of the one or more biological elements;~~ and

iteratively substitute at least one of the symbols by at least another symbol using rules that represent interactions between the biological elements to detect based on the initial hypothetical state a terminal state or alternative resultant states, wherein at least some of the rules are not terminating ~~such terminal states or such alternative resultant states indicative of the presence of one or more biochemical characteristics of the one or more biological elements.~~

97. (Original) The article of claim 96 wherein one or more of the rules comprises an operator for expressing a relationship between at least two of the biological elements, the operator conforming to associative and commutative properties.

98. (Original) The article of claim 96 wherein one or more of the rules expresses concurrent state transitions.

99. (Canceled)

100. (Original) The article of claim 96 wherein at least one of the rules represents a feedback or feedforward interaction between biological elements.

101. (Canceled)

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102. (Original) The article of claim 96 wherein one or more of the symbols representing the biological elements is typed.

103. (Original) The article of claim 102 wherein the types of symbols are organized in hierarchical classes.

104. (Original) The article of claim 103 wherein a symbol for one of the hierarchical classes is matched by any symbol that is a member of the hierarchical class.

105. (Currently Amended) ~~The article of claim 96 wherein the software is further configured to cause the processor to~~ An article comprising machine-readable media having encoded thereon software configured to cause the processor to:

receive a set of symbols in an inference engine, the set of symbols representing an initial hypothetical state of a biological system, wherein the symbols represent biological elements;

iteratively substitute at least one of the symbols by at least another symbol using rules that represent interactions between the biological elements to detect based on the initial hypothetical state a terminal state or alternative resultant states;

receive a second set of symbols for a hypothetical second state of the biological system; and

compare the second set of symbols to the terminal state or to at least one of the alternative resultant states.

106. (Currently Amended) An article comprising machine-readable media having encoded thereon software configured to cause the processor to:

receive information for a first state of a biological system, wherein the information comprises values, each value reflecting the abundance of a biological element in the first state;

generate symbols representing biological elements of the system, wherein generating comprises comparing each value to a threshold parameter for the value, and generating a symbol for the biological element whose abundance is reflected by the value if the value exceeds the threshold parameter; and

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iteratively substitute one or more of the symbols representing biological elements by at least another symbol representing a biological element using rules that represent interactions between the biological elements until a terminal state or until alternative resultant states are detected.

107. (Original) The article of claim 106 wherein one or more of the symbols representing the biological elements is typed.

108-125. (Canceled)

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